

# ENERGY TECHNOLOGY ENGINEERING CENTER

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ROCKETDYNE DIVISION, ROCKWELL INTERNATIONAL

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TITLE: D&D PLAN FOR BUILDING 012

## - APPROVALS -

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## 1.0 INTRODUCTION

The purpose of this document is to describe the Project Work Plan required to complete the decontamination and decommissioning (D&D) of the remaining concrete vault structure of Building 012 so that it can be released for use without radiological or hazardous materials restrictions. The plan addresses additional radiological and hazardous materials assessment tasks required to update and refine previously conducted surveys of the Building 012 concrete vault. D&D activities associated with asbestos floor tile and insulation removal, removal of fuel storage tubes, paint and surface concrete removal, electrical conduit and wire removal, ventilation system removal, and steel liner removal (if required) are described. Special emphasis on personnel safety, the minimization of generated waste, and avoiding the creation of new mixed waste will be incorporated into work procedures.

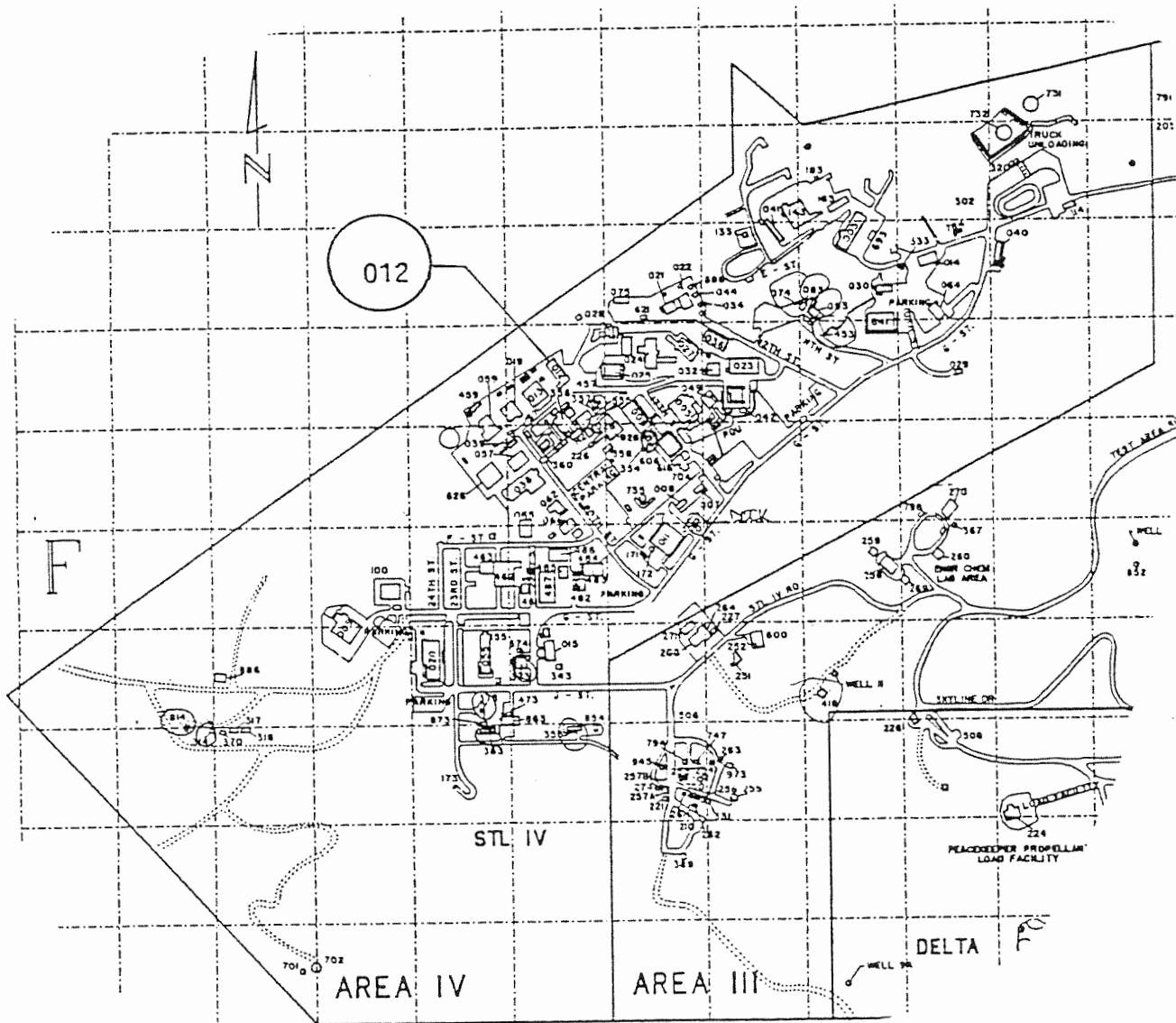
All work will be performed in accordance with procedures which comply with applicable DOE Orders, and Federal, state, and local regulations.

## 2.0 BACKGROUND

Building 012 is located in Area IV of the Rockwell International Santa Susana Field Laboratory (SSFL) near Chatsworth, California (Figure 1). The Building 012 facility was used as a critical experiment test facility for SNAP (AEC) reactors in the 1960s and early 1970s. Unclad fuel was stored and used in the building. As a result, rooms 109 and 110 became slightly contaminated with enriched (typically 93%) uranium.



Figure 1. Santa Susana Area IV Site Map







Building 012 originally consisted of two sections connected with an enclosed passageway (Figure 2). The passageway and metal portion of the building containing the operations and control rooms had previously been demolished in order to build the ETEC/SCTI Power Pak section of the ETEC/SCTI Cogeneration Project. The concrete vault portion of the facility remains and is used as a structural support foundation for the cogeneration unit.

The concrete vault consists of two rooms, room 109 (fuel storage/equipment room) and room 110 (critical test cell), Figure 3. The critical assembly was removed when the facility was deactivated and the cell (room 110) was used for industrial radiography for a short period of time. Room 109 is divided by a 20-inch thick borated concrete wall in which fuel storage tubes are embedded. An air conditioning duct runs the length of the room over the fuel storage area. The critical cell (room 110) is a steel lined, 4-ft thick concrete walled chamber that can be secured by a heavy shield (vault type) door. Currently, there are no equipment, water, or active lighting in the building. Building 012 is inside a fenced area and the only entrance is through a secured door into room 109.

### 3.0 RADIOLOGICAL ASSESSMENT

A radiological survey of the Building 012 concrete vault was conducted in 1985 preparatory to construction of the ETEC/SCTI cogeneration plant. The results of the survey (Ref. 1) indicated the presence of alpha contamination in both rooms 109 and 110 of the concrete vault.



Figure 2. Original Configuration of Building 012

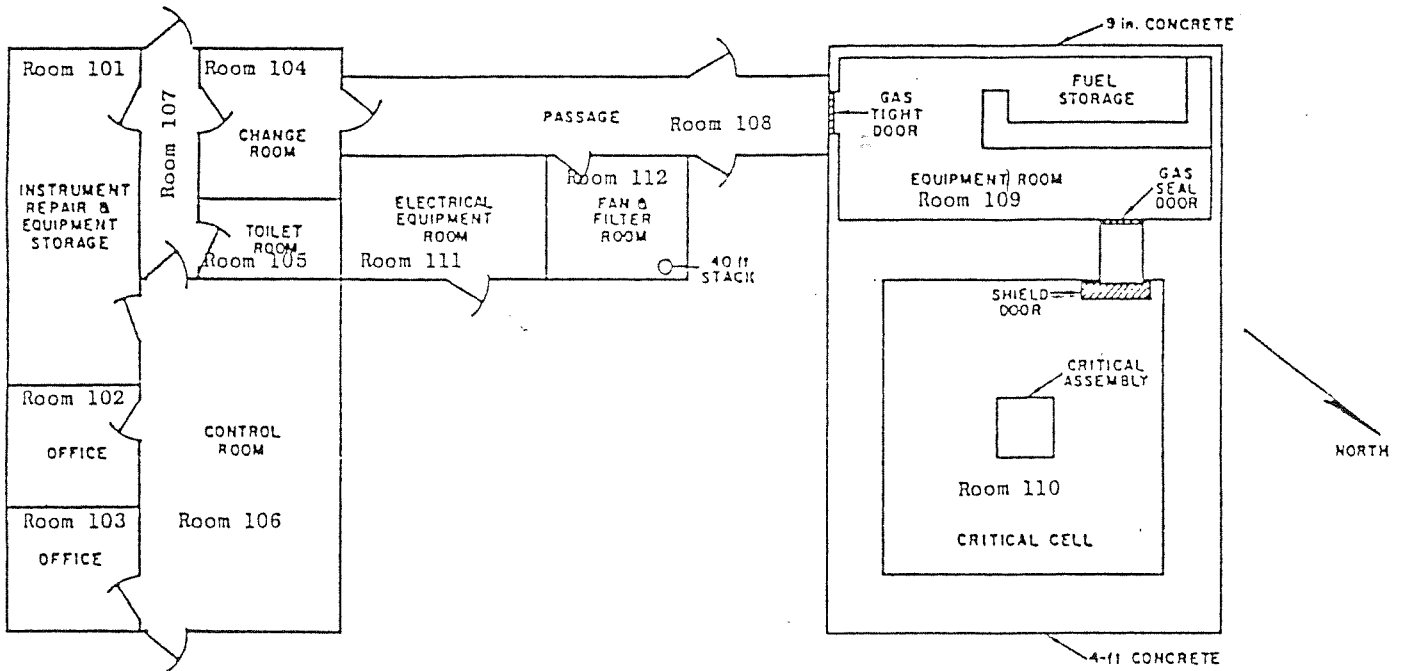
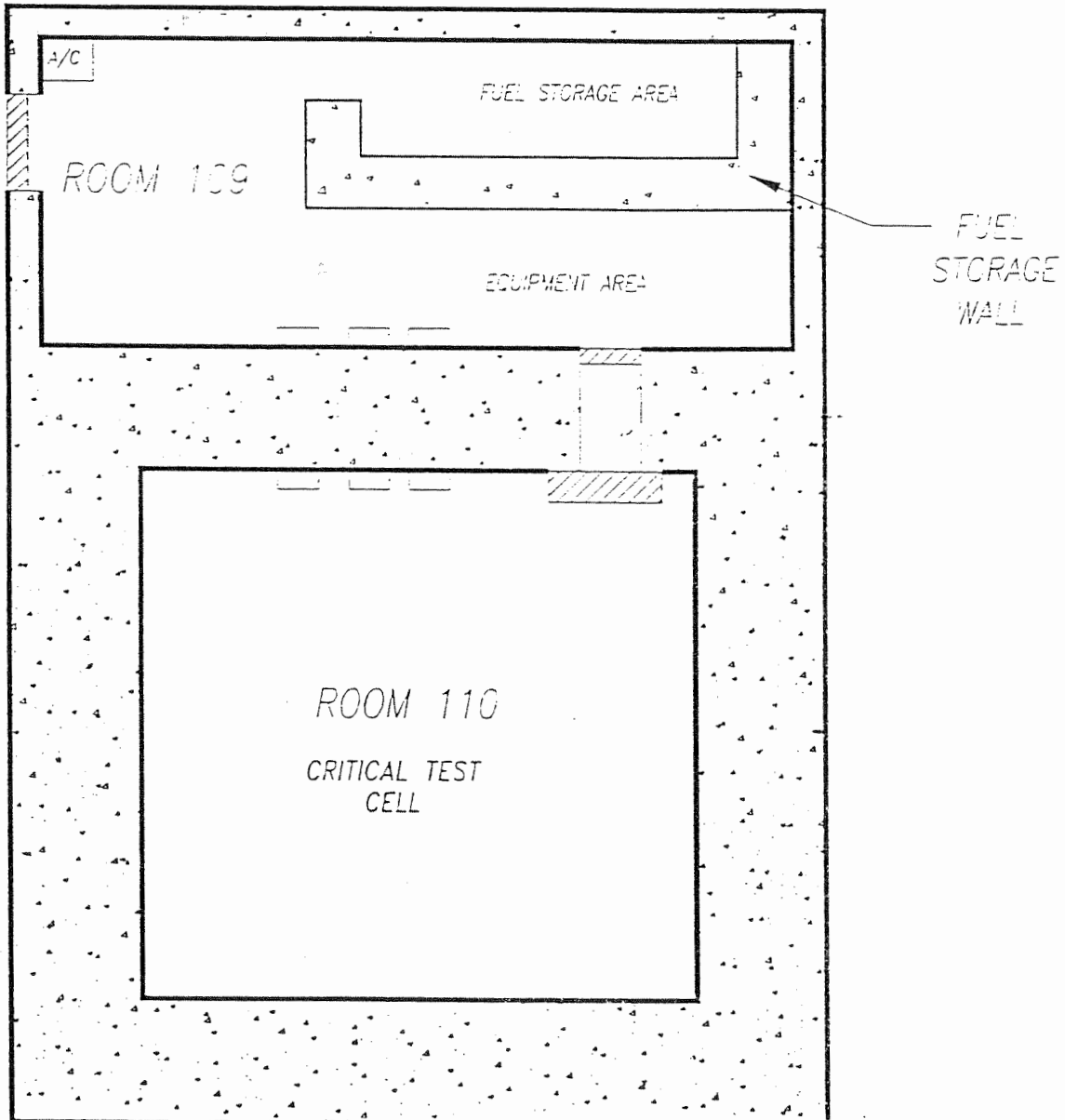




Figure 3. Plan View of Remaining Building 012 Concrete Vault





The equipment area of room 109 exhibited alpha contamination at the entrance door (840-1400 dpm alpha/100 cm<sup>2</sup>), overhead light fixtures (2800 dpm alpha/100 cm<sup>2</sup>), air conditioning duct (840-2800 dpm alpha/100 cm<sup>2</sup>), radioactive exhaust duct (4200 dpm alpha/100 cm<sup>2</sup>), and steel door frame between rooms 109 and 110 (1960 dpm alpha/100 cm<sup>2</sup>). Spot checks of the concrete floor surface under the floor tile revealed contamination levels of 1400-2800 dpm alpha/100 cm<sup>2</sup>.

Survey of the fuel storage area of room 109 revealed contamination of the concrete floor (up to 6500 dpm alpha/100 cm<sup>2</sup>). The opening size of fuel storage tubes prevented adequate survey of the tubes with the available survey instrumentation. However, meter surveys at the entrance of the tubes indicated contamination levels up to 6000 dpm alpha/100 cm<sup>2</sup>.

The walls, ceiling, and floor of the critical test cell (room 110) are covered with paint which prevented meaningful alpha surveying. However, the walls were stencil painted "CAUTION, FIXED ALPHA RADIOACTIVE MATERIAL," but no level of contamination was indicated. Contamination was indicated on the light fixtures (2800 dpm alpha/100 cm<sup>2</sup>) and electrical boxes (280-840 dpm alpha/100 cm<sup>2</sup>).

#### 4.0 SCOPE OF WORK

The objective of this project is to D&D the remaining concrete vault structure of Building 012 sufficiently to permit its use without radiological or chemical contamination restrictions. The accomplishment of this objective will include completion of radiological and chemical contamination assessment surveys; removal of





asbestos containing floor tiles and pipe insulation; removal of contaminated fuel storage tubes; removal of electrical light fixtures, conduit and ventilation system; paint sampling and removal; and scabbling of floor, wall, and ceiling surfaces.

After completion of the decontamination activities, final surveys for radiological and chemical contamination will be performed. Surface contamination release limits for the Building 012 structure shall be as follows.

Type of Contamination	Release Limits	
	Removable (dpm/100 cm <sup>2</sup> )	Fixed (dpm/100 cm <sup>2</sup> )
Alpha*	1000	5000 --
Beta-gamma	1000	5000

\*Enriched uranium

## 5.0 BUILDING 012 D&D WORK PLAN

- 5.1 The radiological assessment survey of rooms 109 and 110 will be completed. Special radiation detection equipment will be obtained that will physically fit into the fuel storage tubes so that accurate assessment of contamination in the tube internals can be accomplished.
- 5.2 Rooms 109 and 110 will be surveyed for the presence of chemical contamination. Paint samples will be collected and analyzed for radiological and chemical (lead) contamination prior to removal. Floor tiles, mastic, and pipe insulation will be analyzed for radiological and asbestos contamination prior to removal.
- 5.3 All contaminated fuel storage tubes will be core drilled out of the borated concrete storage walls. The cored out



cavities will be surveyed for contamination and filled with grout to maintain structural stability of the walls. The cored out storage tubes will be disposed of as low level radioactive waste (LLW).

- 5.4 All floor tile, mastic, and pipe insulation that contains asbestos and is not radiologically contaminated will be removed and disposed of by a state licensed asbestos abatement contractor.
- 5.5 Contaminated electrical light fixtures, conduit, piping, ventilation ducting and equipment will be removed and disposed of as LLW.
- 5.6 The existing paint on the concrete walls and ceiling of room 109 and the steel lined walls, ceiling, and floor of room 110 will be removed and disposed of as LLW, low level mixed waste or hazardous waste based on results of chemical analysis.
- 5.7 The contaminated areas of concrete surfaces will be decontaminated by scabbling. Contaminated steel surfaces will be decontaminated using nonhazardous liquid and foam cleaners and abrasive grinding as required.
- 5.8 Results of the radiological survey conducted in 1985 (Ref. 1) indicated that the steel liner and underlying concrete and rebar of room 110 have not been activated. It is anticipated that the steel liner can be successfully decontaminated and removal of the steel liner will not be required. The steel liner will be surveyed after paint removal to verify that activation has not occurred.
- 5.9 After completion of the decontamination activities, final radiological and chemical contamination surveys will be



conducted for the Building 012 concrete vault structure to confirm the adequacy of the decontamination efforts. If any contamination above release limits is found during the final surveys, the contaminated areas will be decontaminated and resurveyed.

## 6.0 WASTE VOLUME ESTIMATES

The categories of waste generated from this project are expected to be (1) low level radioactive waste (LLW), (2) hazardous waste, and (3) LLW-mixed waste. The LLW will include fuel storage tube cores, light fixtures, conduit, piping, ventilation ducting, air conditioning unit, concrete rubble, and soft trash. Hazardous waste will include floor tiles, mastic and pipe insulation that contains asbestos, paint that contains lead, light ballasts that contain PCB, freon from the air conditioner, and a small volume of hydraulic oil from the critical cell door actuator. A moderate volume of mixed waste resulting from the removal of radioactively contaminated paint that contains lead and contaminated floor tile and insulation that contains asbestos is anticipated.

The estimated volumes of waste generated from this project are presented in Table I. The estimates of waste volumes are based on the assumptions that no more than 30 fuel storage tubes will have to be removed and that the steel liner in the critical test cell (room 110) will not have to be removed.

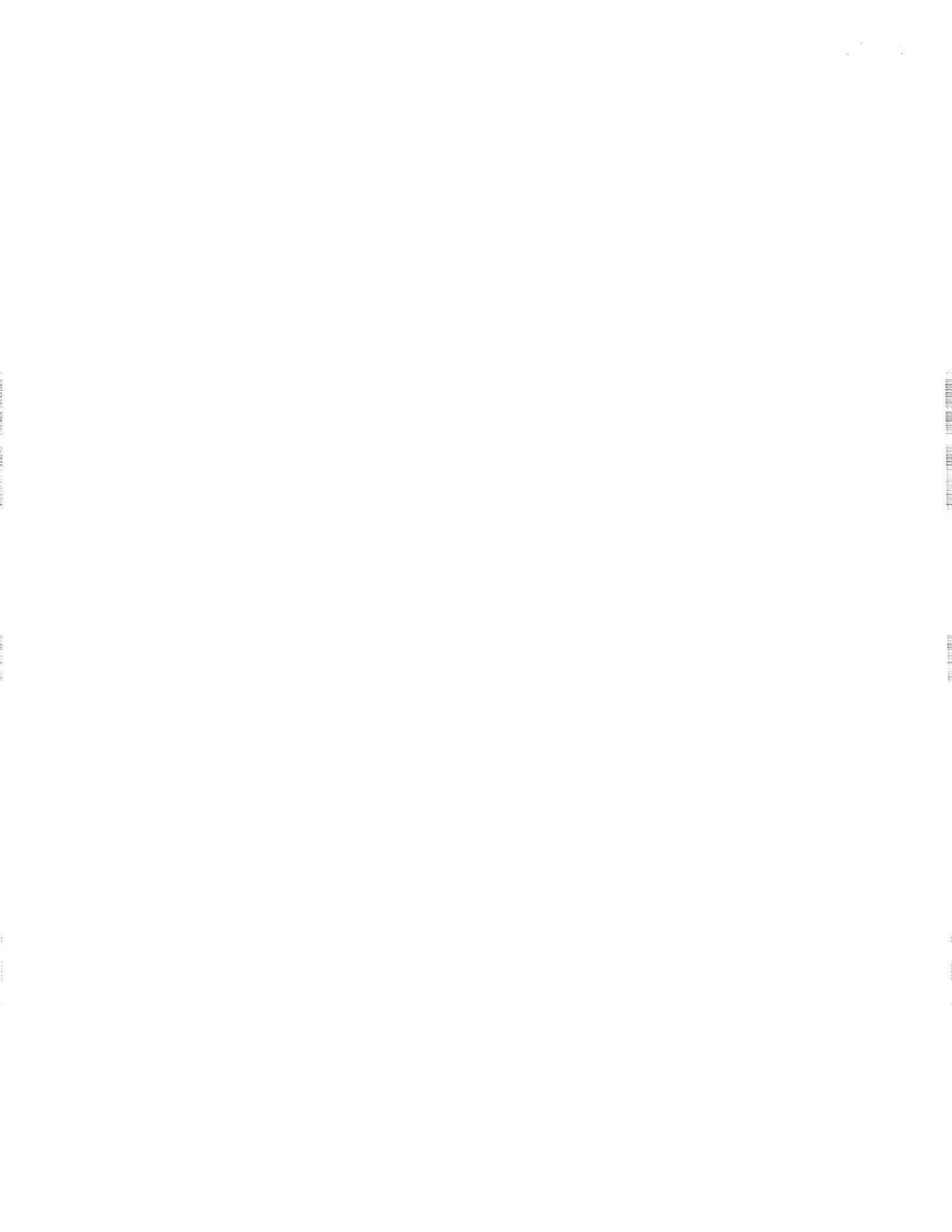


Table I. Estimated Waste Volumes

Waste Category	Packaged Volume (cu ft)
LLW	900
Hazardous waste (asbestos, leaded paint)	250
Mixed waste (leaded paint, stabilized)	300

## 7.0 COST ESTIMATE

This cost estimate assumes that the quantity of fuel storage tubes required to be removed does not exceed thirty and that the steel liner in room 110 (critical test cell) does not have to be removed.

- 7.1 Nuclear Operations Engineering will prepare work plans, detailed procedures, provide technical coordination, arrange for any outside procurements and/or subcontracts and prepare a final D&D report for the Program Office.
- 7.2 Nuclear Operations mechanics will perform all labor associated with core drilling of fuel storage tubes, removal of materials and equipment, paint removal, concrete surface scabbling, decontamination of steel surfaces, and providing support for radiological and chemical contamination surveying and subcontractor work.
- 7.3 RP&HPS health physicists (HPs) will be responsible for surveying for RA contamination, taking of smears and samples of loose debris, and interpreting the RA survey data that is taken and provide oversight to ensure that safe working conditions and practices are employed.





- 7.4 Materials and equipment include items required for RA surveying, decontamination activities, protective enclosures, exhaust systems, and personnel protection.

Cost Summary

Function	Hrs	K\$
Project Management	660	
Plans & Procedures	360	
Hazardous Materials Removal	412	5.0
D&D Activities	2780	
RA & Chemical Surveys, Monitoring, & Reports	580	
Materials & Equipment	160	48.0
Waste Disposal	477	138.0
Totals	5429	191.0



## 8.0 PROJECT SCHEDULE

Building 012 D&D, WBS 1.4.8.8.2.1.3.2

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## 9.0 DOCUMENTATION

### 9.1 D&D PROCEDURES

The performance, control, and documentation of the work required under this work plan will be accomplished by the preparation and implementation of D&D procedures. These procedures will describe the scope of work, applicable documents and references, equipment and materials, general and special requirements, work prerequisites, and step-by-step instructions with sign-off provisions. The procedures will address RA and chemical contamination surveys and assessments, and D&D activities for Building 012.

### 9.2 RECORDS

A daily record of operations will be prepared and kept by the facility person-in-charge (PIC) in a work logbook. The use and control of this logbook will be per ETEC Procedure 6-04, Rev. B, "Use and Control of ETEC Logbooks." Completed procedures and other documents will be stored at Building 009 and put into the Project File at completion of the work.

### 9.3 TRAINING

The training of personnel will be in accordance with ETEC Procedure 1-02, Rev. D, "Training Programs." Prior to the performance of any work per the D&D procedures, a training log (Table II) will be filled out for each individual and signed by the appropriate personnel. The facility PIC will verify that the training is complete and up-to-date. If during the course of the scheduled D&D activities additional training is required or identified, the



facility PIC will add this training to the training sheet and have all applicable personnel trained. Copies of training records will be maintained at Building 009 by the facility PIC.

## 10.0 SUPPORT ORGANIZATIONS

The following support organizations will be directly involved with the planning, review, and approval of all pertinent areas within the D&D operations and procedures.

### 10.1 QUALITY ASSURANCE AND TRAINING

The responsibility of Quality Assurance (QA) Engineering is to assure that the program is performed in accordance with the requirements set forth in DOE Order 5700.6C, "Quality Assurance." The QA organization will review and approve all plans and procedures in accordance with ETEC procedures.

### 10.2 HEALTH, SAFETY AND FIRE ENGINEERING (HS&FE)

HS&FE functions are primarily to monitor compliance with applicable Federal and State regulations, company policies and procedures, and DOE Orders as well as ensuring a safe and healthful working environment. This includes but is not limited to the following subjects: protective clothing and equipment, noise protection measures, confined space entry, materials handling, and exposure to hazardous substances.

### 10.3 ENVIRONMENTAL PROTECTION

Environmental Protection is responsible for monitoring the program activities to assure that they are in compliance





with Rocketdyne's environmental and pollution control policies, including Federal, State, and county regulations. This function is involved in all matters concerning: permits and inspections; release of environmental information; pollution incidents; waste quantity minimization; waste product disposal; spill control and contingency planning; air pollution episodes; discharges to land, surface water, ponds, and ground water; storage of hazardous substances and waste; and asbestos removal. Environmental Protection will review all documents that pertain to hazardous materials handling and other environmental issues.

#### 10.4 RADIATION PROTECTION AND HEALTH PHYSICS SERVICES (RP&HPS)

The Radiation Protection and Health Physics Services organization is responsible for administering the "as low as reasonably achievable" (ALARA) program and for assuring implementation of a radiological safety program. To assure that ALARA is being effectively practiced, the RP&HPS is responsible for reviewing procedures and operations, providing dosimetry services, monitoring work sites, radiation instrument calibration, and advising on regulatory and license conditions. RP&HPS also conducts the final survey and maintains radiological data (radiation and contamination survey results) as called out in the operating procedures.

#### 10.5 NUCLEAR OPERATIONS

Nuclear Operations is responsible for the control and coordination of radioactive waste management. Nuclear Operations is the primary interface for activities associated with the coordination of waste disposal site acceptance criteria, for regulatory agency requirements,



and packaging and transportation requirements. The RA contaminated waste removed during operations under this plan will then be size reduced, packaged for shipment, and shipped from the RMDF which is under Nuclear Operations cognizance.

#### 11.0 REFERENCES

1. 355-ZR-0012, Radiation Survey of Building T012, SCTI Co-Generation Project, Revision A, 1985



TABLE II. TRAINING LOG

Name:		Operating Instructions:	
Course Title	Expiration Date	Verify	Comments
RA physical			
Hazardous Waste Handling (4001)			
RA Hazardous Waste Packaging & Transportation (4028-1)			
Confined Space Entry (4002)			
DOE Radworker II (4081)			
Respirator (1029)			
Forklift & Crane			
Radworker Dressout (4071)			
Facility Familiarization (B/012)			
Hazardous Material Communications (4010)			

